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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/641,302	08/15/2003	In Tae Hwang	CIT/K-0064A	3551

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Chantilly, VA 20153-1200

EXAMINER
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MOORE, TERENCE J

ART UNIT	PAPER NUMBER
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2609

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/27/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/641,302	<b>Applicant(s)</b> HWANG, IN TAE	
	<b>Examiner</b> Terence Moore	<b>Art Unit</b> 2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 August 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 18-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 18-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 09/280,849.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>15 August 2003</u> | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Priority***

1. Applicant's claim for domestic priority under 35 U.S.C. 120 is acknowledged.
2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 09/280,849, filed on March 30, 1999.

### ***Information Disclosure Statement***

3. The information disclosure statement submitted on August 15, 2003 has been considered by the Examiner and made of record in the application file.

### ***Preliminary Amendment***

4. The present Office Action is based upon the original patent application filed on August 15, 2003 as modified by the preliminary amendment filed on March 25, 2004.  
**Claims 1 and 18-22** are now pending in the present application.

### ***Specification***

5. The disclosure is objected to because of the following informalities:
  - (a) On **page 3, line 13**, the phrase "...having the down link slots and the up link slots are assigned equally" should read "...having the down link slots and the up link slots assigned equally".

(b) On **page 3, line 14**, the phrase "In such as case," should read "In such a case".

(c) On **page 4, lines 1-2**, the phrase "having down link slots and up links slots" should read "having down link slots and up link slots".

(d) On **page 4, line 4**, the phrase "between the mobile station and the base station can be solved with easy" should read "between the mobile station and the base station can be easily solved".

(e) On **page 5, line 3**, the phrase "communication services at almost a time" should read "communication services at almost the same time".

(f) On **page 5, line 9**, the phrase "communication services at almost a time" should read "communication services at almost the same time".

(g) On **page 7, line 4**, the phrase "down link slots and up links slots" should read "down link slots and up link slots".

(h) On **page 12, lines 9-10**, the phrase "data transmission at a substantially same time" should read "data transmission at substantially the same time".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claims 1, 18, and 20-22** are rejected under 35 U.S.C. 102(b) as being anticipated by **Papadopoulos et al. (U. S. Patent No. 5,602,836)**.

Consider **claim 1**; Papadopoulos et al. clearly show and disclose a method of communication between a mobile station and a base station in a mobile communication system, comprising the steps of:

[(1)] when a mobile station receives a data transmission request, providing one portion of a period of a data frame with regular number and arrangement of down link slots and up link slots and the other portion of the data frame with irregular number and arrangement of down link slots or/and up link slots depending on characteristics and amount of subscriber data to be transmitted (Papadopoulos et al. show and disclose communications between a base station and a mobile station in a cellular communications network (**figure 1 and column 3, lines 41-54**). One kind of frame that can be used for this type of communication is a shared time-division duplexing (STDD) frame as shown in **601** in **Figure 6**, which is (partially) comprised of an uplink section **610**, downlink section **615**, and shared slots **620**. The uplink and downlink sections **610** and **615** contain slots that are permanently allocated to uplink and downlink information transmission, respectively (**column 8, lines 7-10**). The shared slots **620** are dynamically allocated between uplink and downlink transmission in accordance with demand (**column 8, lines 14-16**). The uplink and downlink sections (**610, 615**) together read on the portion of the data frame with a regular number and arrangement of down link and up link slots, and the shared slot section (**620**) reads on the portion of the data

frame with irregular number and arrangement of down links and/or up links depending on the characteristics and amount of data to be transmitted);

[(2)] determining a transmission type according to which a communication is executed using a competition period for determining priorities of the subscriber data, a reservation period for making a reservation for time slots for use in transmission of the subscriber data, and an assignment period for assigning a time slot according to an amount of the subscriber data, which periods are selectively and respectively included in the one portion of the data frame and in the other portion of the data frame (Papadopoulos et al. disclose various methods of determining how to allocate slots for uplink and downlink data. **Figure 13** details one such method involving circular interleaving. It is described that users who are blocked from being transmitted on an earlier data frame may receive slot allocation priority on the next data frame (**column 15, lines 48 – column 16, line 9**). When a given user enters an active state by initiating a conversation, a queue position is assigned to that user in step **1306** in **Figure 13** (this is equivalent to making a reservation for a transmission slot) (**column 15, lines 5-7**). In step **1312** in **Figure 13**, an attempt is made to allocate a time slot in the current frame to a given user, and if this is successful, communication with the far-end user can place in the allocated slot as shown in step **1316** (**column 15, lines 17-20**). This allocation represents the assignment period for time slots. These time slots can be in either the “static” portion of the data frame (the uplink section **610** and downlink section **615** from **Figure 6**) or the “dynamic” portion of the data frame (the shared slots **620** from **Figure 6**)); and

[(3)] providing the data frame according to the transmission type and transmitting to the base station (communication with the far-end user in the allocated slot occurs in step 1316 in **Figure 13 (column 15, lines 19-20)**). This communication is described as being transmitted either (a) between the mobile station and the base station (i.e., uplink) or (b) between the base station and the mobile station (i.e., downlink) (**column 3, lines 41-54**)).

Consider **claim 18**, Papadopoulos et al. clearly show and disclose an apparatus configured to process a frame of data, wherein:

a portion of the frame is configured for synchronous duplexing communication;  
and

a portion of the frame is configured for asynchronous duplexing communication. (As described above, Papadopoulos et al. disclose (in **Figure 6**) a shared time-division duplexing (STDD) frame which includes uplink and downlink information sections **610** and **615** that are permanently allocated to uplink and downlink information transmission, respectively (**column 8, lines 1-10**). The STDD frame also includes a group of shared slots **620** that are dynamically allocated between uplink and downlink transmission in accordance with demand (**column 8, lines 14-16**). The uplink and downlink information sections **610** and **615** are always transmitted in an STDD frames transferred back and forth between the mobile station and the base station; assuming the STDD frames are sent at regular intervals, this would constitute the portion of the data frame configured for synchronous duplexing communication. The shared slots **620**, by virtue of their dynamic allocation, may not always contain either uplink information or downlink

information in each STDD frame, and therefore this would constitute the portion of the data frame configured for asynchronous duplexing communication, since information will not necessarily be transmitted at regular intervals. The base station **105** and the mobile station **110** (see **Figure 1**) read on apparatuses configured to receive to process these frames of data, since the STDD frames are intended to be exchanged back and forth between the base station **105** and the mobile station **110**).

Consider **claim 20**, Papadopoulos et al. clearly show and disclose the apparatus of **claim 18**, wherein the apparatus is at least one of a base station, a mobile device, and a switching center (In **figure 6**, Papadopoulos et al. disclose the STDD frame which was discussed in detail in **claim 18** above. It is intended that these STDD frames be passed back and forth between a base station **105** and a mobile station **110** in a cell **102** (see **Figure 1**). Hence, the apparatus that would use these frames is at least one of a base station, a mobile device, and a switching center).

Consider **claim 21**, Papadopoulos et al. clearly show and disclose the apparatus of **claim 18**, wherein:

synchronous duplexing communication is time division duplexing with an equal number of uplink time slots and downlink time slots (Papadopoulos et al. disclose an STDD frame in **figure 4** which contains an uplink section with a total of  $U_s$  information slots and a downlink section with a total of  $D_s$  information slots. Assuming that no slots go unused, the total number of speech slots  $S$  is equal to  $U_s + D_s$  (**column 5, lines 9-14**). When there are few users in the system, the information slots behave in a TDD manner with the  $S$  slots equally partitioned for the uplink and downlink access (**column**



**5, lines 18-22**). This illustrates an equal number of uplink time slots and downlink time slots); and

wherein each of the uplink time slots and the downlink times slots have the same data capacity (Papadopoulos et al. disclose that when there are few users in the system, the information slots behave in a TDD manner with the S slots equally partitioned for the uplink and downlink access (**column 5, lines 18-22**). It is also mentioned that when the number of users increases and the number of required speech slots in either direction exceeds half of S (or  $S/2$ ), that the number of uplink and downlink slots varies according to demand (**column 5, lines 23-26**). This is also illustrated in **Figure 4** by moving partition **412** so that  $U_s$  does not equal  $D_s$ . Since it is never mentioned that any particular slots have greater capacity than any other slots, particularly when the number of uplink and downlink slots vary according to demand (when this occurs, an uplink slot could become a downlink slot, or vice versa, and the uplink and downlink information transmission capacity could vary unexpectedly if the slot sizes were unequal), it can be safely assumed that each of the uplink time slots and downlink time slots have the same data capacity).

Consider **claim 22**, Papadopoulos et al. clearly show and disclose the apparatus of **claim 18**, wherein the apparatus is a radio communication device (Papadopoulos et al. show and disclose an exemplary communication system in accordance with their invention (see **1200** in **figure 12**). **Figure 12** shows an RF processor **1220** and an antenna **1224** in which data packets are modulated onto one or more carrier frequencies and broadcast to mobile users. The reverse process (reception of packets

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and subsequent demodulation) also occurs here in a demodulator **1228 (column 14, lines 15-27)**. Hence, the apparatus is a radio communication device).

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Papadopoulos et al. (U. S. Patent No. 5,602,836)** in view of **Kobayashi et al. (U.S. Patent No. 5,719,859)**.

Consider **claim 19**, Papadopoulos et al. clearly show and disclose the apparatus of **claim 18**, wherein:

the portion of the frame configured for asynchronous duplexing communication includes uplink time slots and downlink times slots that are arranged according to data traffic demands of the apparatus (Papadopoulos et al. describe the shared slots **(620)**

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part of the asynchronous duplexing communication portion of the STTD frame (described above in **claim 18** and shown in **figure 6**) as being dynamically allocated between uplink and downlink transmission in accordance with demand (**column 8, lines 14-16**)).

However, Papadopoulos et al. do not disclose that the portion of the frame configured for synchronous duplexing communication includes alternating uplink time slots and downlink time slots.

In the same field of endeavor, Kobayashi et al. disclose a data frame with 4 downward time slots followed by 4 upward time slots, followed by another frame comprised of 4 downward time slots followed by 4 upward time slots, and so on for synchronous behavior (see **Figure 3** and **column 5, lines 34-37**, which points back to **Figure 2** and **column 1, lines 23-32** for description of conventional bidirectional Time Division Multiple Access (TDMA) communications).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a synchronous duplexing communication technique including alternating uplink time slots and downlink time slots, as shown by Kobayashi et al., in the frame of data to be received by the frame processing apparatus taught by Papadopoulos et al., for the purpose of constructing the frame such that the synchronous portion of the frame and the asynchronous portion of the frame were completely separated and therefore more easily found in the frame.

***Conclusion***

11. Any response to this Office Action should be **faxed to (571) 273-8300 or mailed to:**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**Hand-delivered responses** should be brought to

Customer Service Window  
Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

12. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Terence Moore whose telephone number is (571) 270-1775. The Examiner can normally be reached on Monday-Friday from 7:30 am to 5:00 pm (alternate Fridays off).

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Rafael Pérez-Gutiérrez can be reached on (571) 272-7915. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For


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more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 571-272-4100.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

Terence Moore  
T.M./tm

March 20, 2007

  
RAFAEL PEREZ-GUTIERREZ  
SUPERVISORY PATENT EXAMINER

3/21/07